REMARKS

Claim rejections under 35 USC 103

Claims 1-21, 23, 25-27, and 29 have been rejected under 35 USC 103(a) as being unpatentable over Bradley (6,769,021) in view of Latif (6,400,730). Applicant respectfully traverses this rejection, as is now discussed in detail. Applicant treats claim 1 as representative of the claimed invention in this respect.

Claim 1 is limited to three separate elements. First, there is a means for communicating between a first host and *a storage area network using a storage area network protocol* in a non-ESCON protocol manner, where the storage area network includes a plurality of storage devices exclusive of the first host. Second there is a means for communicating between a second host and *the storage area network using the storage area network protocol* in a non-ESCON protocol manner, where the storage devices are also exclusive of the second host. Third, there is a means for communicating directly between the first and second hosts *using the storage area network protocol* in a non-ESCON protocol manner without passing through a storage device.

The Examiner has indicated that Bradley teaches, discloses, or otherwise suggests all three elements of the claimed invention, with the exception of the non-ESCON protocol manner limitation. (See office action, pp. 2-3.) Applicant respectfully disagrees with the Examiner in this respect. In particular, Bradley does not disclose a storage area network with which the first and the second hosts communicate using a storage area network protocol. Furthermore, Bradley does not disclose the first and the second hosts communicating directly with one another using the storage area network protocol. Applicant now discusses this in detail.

However, Applicant first notes that he is very much cognizant that the present rejection is proffered under 35 USC 103(a) over a combination of two references, Bradley and Latif. While it may appear that Applicant is improperly attacking this rejection by attacking a single reference,

this is not the case. Rather, Applicant is showing how Bradley does not teach the limitations of the claimed invention that the Examiner says that Bradley does, such that Bradley in combination with Latif does not teach all the limitations of the claimed invention. In other words, Applicant is attacking the overall combination of Bradley with Latif by particularly showing how Bradley does not disclose the aspects of the claimed invention that the Examiner says Bradley discloses. Insofar as Bradley does not disclose these aspects of the claimed invention, then the obviousness rejection made by the Examiner that relies upon Bradley disclosing these aspects of the claimed invention necessarily fails.

What the claimed invention is directed to

First, Applicant would like to take a moment to explain what the claimed invention "is." The claimed invention novelly uses a storage area network (SAN) for communication between two hosts (i.e., not between a host and a storage device). Thus, claim 1 is limited to means for communicating between each of a first host and a second host and a storage area network using a storage area network protocol, and further (and most importantly) means for communicating directly between the first and second hosts using a storage area network protocol. The idea here is that a SAN is used not only for host-to-storage device communication, but is also used for host-to-host communication.

To better illustrate this, the Examiner is referred to FIGs. 1-3 of the patent application as filed. In FIG. 1, a typical SAN in accordance with the prior art is shown. Hosts 1 and 2 communicate over the SAN 5 with the storage devices 6, but cannot communicate with one another over the SAN 5, as is customary. For host-to-host communication to occur, what is typically accomplished in the prior art is what is shown in FIG. 2. In FIG. 2, there is one network 10 for the host 8 to communicate with the host 9, and then there is a SAN 11 so that the hosts 8 and 9 can communicate with the storage devices 12. That is, there are two networks: the network 10, and the SAN 11.

Finally, we get to FIG. 3 of the patent application as filed. In FIG. 3, hosts 14 and 15 can communicate with the storage devices 16 over the SAN 17, but very importantly, can communicate with one another via the SAN 17. This is the crux of the invention insofar as patentability is concerned. What Applicant is claiming, in other words, is that two hosts can communicate with each other directly, using a storage area network protocol, over a storage area network. An additional network, like the network 10 of FIG. 2, is not needed by the invention.

What a SAN "is"

Second, Applicant would also like to take a moment to explain what a storage-area network (SAN) "is." The knowledge that one of ordinary skill within the art possesses as to SAN's is that SAN's are used for connecting hosts to storage systems, and storage systems to one another. At the time the patent application was filed, there remained an industry need for high-speed host-to-host connectivity comparable to SAN's. One of ordinary skill within the art, in other words, does not have the knowledge that SAN's can be used for direct host-to-host communication, as opposed to host-to-storage system and storage system-to-storage system communication. Applicant refers the Examiner in this respect to the previously filed Computer Desktop Encyclopedia entry for SAN, which discusses connecting servers (i.e., hosts) to disk storage (i.e., storage systems), and never discusses SAN's being used to connect servers to servers for communication among the servers directly. This reference was filed in conjunction with the previously filed office action response of September 10, 2005. Applicant strongly asserts and submits that a SAN, as understood by one of ordinary skill within the art at the time of filing the present patent application, is for host-to-storage system and storage system-to-storage system communication, and not for host-to-host communication.

What Bradley teaches such that Bradley in view of Latif does not teach the claimed invention

Now, the Examiner has stated that Bradley substantially teaches the first element of the claimed invention, as to means for communicating between a first host *and a storage area network using a storage area network protocol*, in column 1, lines 60-67, and column 2, lines 1-2. The Examiner has stated that Bradley substantially teaches the second element of the invention, as to means for communicating between a second host *and the storage area network using a storage area network protocol*, also in column 1, lines 60-67, and column 2, lines 1-2. Finally, the Examiner has stated that Bradley substantially teaches the third element of the claimed invention, as to means for communicating directly between the first and second hosts *using the storage area network protocol*, also in column 1, lines 60-67, and column 2, lines 1-2. That is, the Examiner has relied upon column 1, lines 60-67, and column 2, lines 1-2, of Bradley as substantially teaching all three elements of the claimed invention: each of a first host and a second host communicating with *a storage area network using a storage area network protocol*, and the first and second hosts communicating directly with one another *using the storage area network protocol*.

Applicant respectfully submits, however, that Bradley does not disclose: (1) any type of storage area network, and, (2) any type of communication using a storage area network protocol. The relied-upon excerpt of Bradley, for instance, discloses the following:

> FIG. 1 shows a prior art subnet 100 with hosts 102a and 102b connected to the subnet 100. Also connected to the subnet 100 are computers (e.g., having SCSI host adapters or the like) 104a and 104b and associated storage nodes (i.e., RAID device) 106a and 106b. The subnet 100 is a shared fabric environment which allows communication between all users connected to the subnet 100. The hosts 102a and 102b each contain NIC's or similar communication circuitry which facilitate communication between the hosts 102a and 102b and the subnet 100. As such, the hosts 102a and 102b are able to communicate with each other and with the other devices on the subnet 100, such as the storage nodes 106a and 106b.

(Col. 1, l. 59, through col. 2, l. 4) This excerpt does not say anything about a storage area network, nor a storage area network protocol. Applicant respectfully submits that the confusion

as to Bradley vis-à-vis the claimed invention lies in the fact that Bradley talks about hosts 102a and 102b communicating with storage nodes 106a and 106b. However, just because there are storage nodes/devices on a network that a host can communicate with does not mean: (1) that the network is *a storage area network*, to which the claimed invention is particularly limited, and which is a particular type of a network as has been noted above; or, (2) that the hosts (in particular) directly communicate with one another using *storage area network protocol*, to which the claimed invention is also particularly limited, and which is a particular type of network protocol employed in SAN's.

Indeed, Bradley prior to this excerpt discusses networks as follows.

> Today's computers are becoming more interactive with other computers in a networking environment. This includes the ability for computers to communicate with other computers on a given network, such as a local area network (LAN). . . .
>
> . . . .
>
> Computers typically communicate over a network through host adapters (e.g., network interface cards "NICs") that allow the computer to interface with the local area networks. The NICs can implement different types of network technologies such as Ethernet, ATM (Asynchronous Transfer Mode), Fibre Channel, and the like. Furthermore, ATM is able to integrate various communication technologies such as LAN and WAN (wide area network) and other voice and transmission networks, thereby creating a unified digital network, or fabric, where all the previously mentioned networks are accessible by one host. Through the local area networks and ATM, hosts are able to communicate with other hosts and any shared peripheral devices associated with other hosts, such as a host computer's RAID device.

(Col. 1, ll. 27-53) Here, Bradley discusses representative type networks, including LAN's and WAN's. LAN's and WAN's are different than SAN's, however, which are particular types of networks. As has been discussed above, a SAN is used within the prior art to communicatively couple hosts to storage devices. The invention, by comparison, novelly uses a SAN for hosts to communicate directly with one another.

The other reference relied upon by the Examiner, Latif, in fact discusses the differences between LAN's and SAN's:

> In enterprise computing environments, it is desirable and beneficial to have multiple servers able to directly access multiple storage devices to support high bandwidth data transfers, system expansion, modularity, configuration flexibility and optimization of resources. In conventional computing environments, such access is typically provided via file system level Local Area Network (LAN) connections, which operate at a fraction of the speed of direct storage connections. As such, access to storage systems is highly susceptible to bottlenecks.
>
> Storage Area Networks (SANs) have been proposed as one method of solving this storage access bottleneck problem. By applying the networking paradigm to storage devices, SANs enable increased connectivity and bandwidth, sharing of resources, and configuration flexibility. The current SAN paradigm assumes that the entire network is constructed using Fibre Channel switches. Therefore, *most solutions involving SANs require implementation of separate networks: one to support the normal LAN and another to support the SAN.* The installation of new equipment and technology, such as new equipment at the storage device level (Fibre Channel interfaces), the host/server level (Fibre Channel adapter cards) and the transport level (Fibre Channel hubs, switches and routers), into a mission-critical enterprise computing environment could be described as less than desirable for data center managers, as it involves replication of network infrastructure, new technologies (i.e., Fibre Channel), and new training for personnel. Most companies have already invested significant amounts of money constructing and maintaining their network (e.g., based on Ethernet and/or ATM). Construction of a second high-speed network based on a different technology is a significant impediment to the proliferation of SANs.

(Col. 1, ll. 26-58) Thus, a LAN or WAN is different than a SAN, as evidenced by the Computer Encyclopedia entry noted above, and as demonstrated by Latif. Therefore, (1) where the Examiner relies upon Bradley as teaching aspects of the claimed invention relating to communication with a storage area network using a storage area network protocol, and to direct communication between two hosts using the storage area network protocol; and, (2) where Bradley is silent as to a SAN and a SAN protocol, and indeed discloses other types of networking technologies, Bradley in view of Latif cannot be considered as disclosing the claimed invention.

Additional comments as to Bradley in view of Latif

Applicant also parenthetically notes the differences between the claimed invention and what Bradley in view of Latif "*at best*" can be considered as disclosing. The following discussion is not particularly relevant to the patentability of the claimed invention over Bradley in view of Latif, since Bradley in particular does not teach the aspects of the claimed invention that it has been relied upon as teaching. However, this discussion is presented to give the Examiner further guidance as to what the invention is, and more importantly how it differs from approaches disclosed in the prior art, such as in Latif.

Now, as has been noted, the invention novelly uses a SAN for direct host-to-host communicating using a SAN protocol. As such, you can use a single network – a SAN – for both host-to-host communication and host-to-SAN/storage device communication; thus, you do not need a separate LAN or other type of network for host-to-host communication. By comparison, Bradley teaches a conventional network for host-to-host communication, as has been described.

Furthermore, Latif approaches a different problem with a different solution. Latif says that if you already have a LAN/WAN, it can be expensive to add on a separate SAN for communication. Therefore, Latif discloses that you can "integrate" or "overlay" a SAN onto an existing LAN/WAN topology so that you do not have a separate LAN/WAN and a separate SAN, but rather a LAN/WAN with an integrated/overlaid SAN. (See col. 2, ll. 15-33.) Latif refers to the existing LAN/WAN topology as an Internet Protocol (IP) network (col. 2, ll. 22-24), which makes complete sense, since LAN's and WAN's are also commonly called IP networks, since they use an IP networking protocol.

Therefore, what Latif does to leverage existing LAN/WAN/IP network topologies to overlay or integrate a SAN thereover or therewith is to embed the SAN protocol into the typical IP protocol, resulting in a hybrid protocol called Storage over Internet Protocol, or SoIP. (See col. 6, ll. 6-22.) This is an interesting approach, but is not relevant to the claimed invention. SoIP

is not a SAN protocol. Rather, SoIP *at best* can be considered a hybrid-SAN protocol, insofar as it relies upon a non-SAN protocol, the IP protocol, to provide for SAN-type communications.

More importantly and significantly, perhaps, it would not make sense (i.e., there is no motivation) to combine the Latif approach to overlaying or integrating a SAN onto or with a conventional LAN/WAN, like that of Bradley, in a way that provides for direct host-to-host communication using a SAN protocol, or even a hybrid-SAN protocol, like SoIP. Here's why. Bradley allows for hosts to communicate with one another via a conventional LAN/WAN protocol, like the IP networking protocol. Now, Latif says you can add in a SAN to such a conventional LAN/WAN by encapsulating SAN-type communications with a hybrid-SAN protocol, like SoIP, which allows the existing IP network and networking protocol to be used. As such, for instance, hosts can communicate with storage devices on the SAN using this hybrid-SAN protocol. However, it would make no sense for hosts to directly communicate with one another using this hybrid-SAN protocol for direct host-to-host communication. Rather, the hosts, per Bradley and as is conventional, already communicate with one another perfectly well using the conventional IP networking protocol. There is thus no motivation to add in additional complexity to have the hosts also use the hybrid-SAN protocol, where both hosts already "know" the conventional IP networking protocol, and this conventional protocol means that there is less networking overhead, etc., insofar as you do not have to take IP communications, encapsulate them into SoIP data packets, and then send them over an IP network, since you can just send the IP communications over the IP network in the first place!

That is, the combination of Bradley in view of Latif has a different "starting point" than the claimed invention. In the claimed invention, you are solving a problem where you have only a SAN, and want to have a way for hosts to communicate with one another over the SAN, by not having to "add in" a conventional LAN/WAN/IP network. By comparison, with Bradley in view of Latif, you start with a conventional LAN/WAN/IP network, and then want to "overlay" or "integrate" a SAN without adding a separate SAN. Thus, the problem answered by the claimed

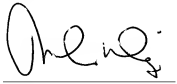
invention is, "if you only have a SAN, how can you have non-storage hosts communicate with each other, in addition to communicating with storage devices on the SAN?" By comparison, the problem answered by Bradley in view of Latif is "if you only have a LAN/WAN/IP network, how can you add in a SAN for communication with SAN-type storage devices without having to build a completely new network?" In the former, the hosts do not have any way to communicate with one another already, hence the invention's approach of using a SAN protocol to provide for direct host-to-host communication over the SAN. In the latter, the hosts already have a way to communicate with one another already, via the LAN/WAN/IP network, hence Bradley in view of Latif's usage of a non-SAN protocol – the IP networking protocol – in a way that allows SAN-type storage devices to communicate with the hosts in a SAN-hybrid way. However, in the latter, the hosts already are able to communicate with one another, so there is no motivation to have them communicate in a non-standard way (via SoIP), where this non-standard way is wholly described as pertaining to SAN-type storage device communication.

Hopefully this preceding discussion serves to inform the Examiner as to the differences between the claimed invention and Bradley in view of Latif. If it does not, however, the Examiner is very much encouraged to contact Applicant's representative, Mike Dryja, at the phone number listed below so that any further information can be provided. Applicant is further potentially amenable to adding additional claim limitations as suggested by the Examiner if doing so would serve to clarify the invention and its patentability vis-à-vis the prior art. However, as it now stands, Applicant firmly believes that the claimed invention is patentable over the prior art as recited by the Examiner, and submits that Applicant's position would be sustained on appeal.

Conclusion

Applicants have made a diligent effort to place the pending claims in condition for allowance, and request that they so be allowed. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Mike Dryja, Applicants' Attorney, at 425-427-5094, so that such issues may be resolved as expeditiously as possible. For these reasons, and in view of the above amendments, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,



July 19, 2006
Date

Michael A. Dryja, Reg. No. 39,662
Attorney/Agent for Applicant(s)

Law Offices of Michael Dryja
704 228th Ave NE #694
Sammamish, WA 98074
tel: 425-427-5094, fax: 206-374-2819